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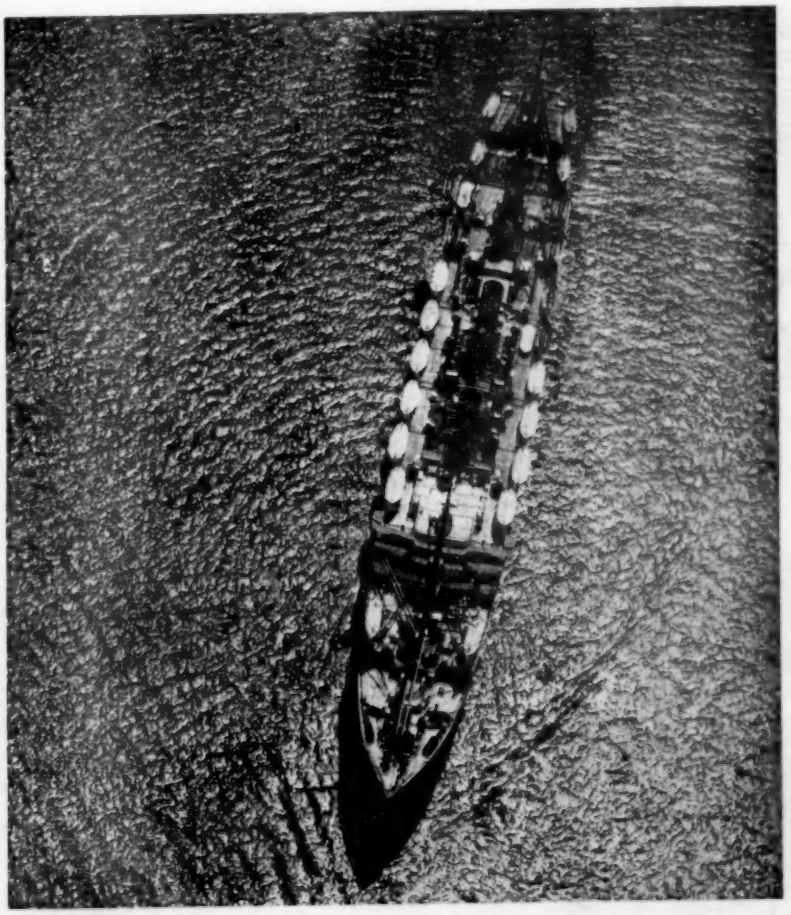
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



JULY 29, 1933

On a Sparkling Sea

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SCIENCE NEWS LETTER

VOL. XXIV No. 642

The Weekly Summary of Current Science

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Edited by WATSON DAVIS

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DO YOU KNOW?

Roman swimming pools 2,200 years ago were built very much like modern pools.

Asbestos and mica are unusual minerals in that they can be bent without breaking.

Many of the earth's deep canyons that lie under the sea have walls thousands of feet high.

A new instrument to aid in straightening cross-eye in children has been designed by scientists at the University of California.

When the British weather bureau was first established in 1854, its main duties were for the sea and navigation, and its chief was an admiral.

The ancient surgical operation of cutting a hole in the skull to remove pressure or "let out the evil" is still practised in Algeria.

President Roosevelt has arranged to plant 36,000 trees of 15 different species on his Hyde Park estate in New York this summer.

Twenty-three companies operating electric street cars are interested in a research program for developing quieter, faster, lighter, and better-looking cars.

A book on first aid was published as far back as 1633.

Diamonds subjected to intense heat burn away in layers.

Doctors have been counting the pulse by watches ever since 1690.

After 16 years of work, Japan has completed a tunnel almost five miles long under the Hakone Mountains.

Poison ivy is found in almost all parts of the United States, except high mountains and deserts.

The famous Tyrian purple, worn by kings, came into use about fifteen centuries before Christ.

Of 10,000 redwood trees planted on the Island of Hawaii in the past 10 years, 97.9 per cent. have survived.

The chief insect pests that damage citrus groves in Japan are entirely different from the major pests of groves in California.

Wearing goggles, hard shoes and other protective garments would safeguard miners from many accidents.

A memorial stone set up to a Roman soldier by his "heir" about 100 A. D. was recently found near the English town of Chester.

WITH THE SCIENCES THIS WEEK

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ENGINEERING
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These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information of the article, but are references for further reading. Books cited can be supplied by Book Dept., Science News Letter, at publishers' prices, prepaid in the United States.

PHYSICS

Spectroscope Puts Rainbow to Work For Industry and Science

Multitude of Jobs Done by Powerful Research Tool in Many Fields Discussed by Scientists and Industrialists

METHODS of putting the rainbow to work by means of the spectroscope were discussed at the Industrial Conference on Spectroscopy at Massachusetts Institute of Technology.

Over 100 scientists and industrialists by attending showed great interest in the spectroscope which is one of the most powerful tools for research. It has innumerable uses and in various applications serves as a watch, detective, balance, speedometer, microscope, camera, tape measure, transit and forgery detector.

Spectroscopists From Abroad

In addition to spectroscopists from this country and abroad, those attending included industrialists and research scientists working in textiles, chemical engineering, explosive manufacturing, metallurgical engineering, astronomy, medicine, biology, coal mining, automotive engineering, paper manufacturing, and wire making.

Many uses of the spectroscope were reported.

One engineer had trouble with automobile radiator caps buckling. The spectroscope revealed impurities in the material undetectable by other means. Another told of a white paint which turned black on exposure to sun. Spectroscopy revealed minute impurities.

The importance of the spectroscope in metallurgical engineering was indicated by the fact that one company has made more than 33,000 spectroscopic photographs during research.

Slight Impurities Detected

In crime detection the spectroscope has enabled investigators to identify materials on clothing.

A coal operator said that it can be told by spectroscopic examination from what seam coal comes. Mining engineers are using spectroscopes to detect minute impurities, which in some cases aid in finding larger amounts.

Because even small amounts of impurities may affect the life of rubber, manufacturers are greatly interested in spectroscopic methods of detecting them. These methods are also of great use in controlling the manufacture of optical glass.

In food industries, the spectroscope is valuable in checking ultraviolet irradiation and in analysis of materials. Dental researchers have found by spectroscope that mottled enamel is due to small impurities in certain drinking waters. In the case of an appendix operation where glass was found, the spectroscope revealed fragments did not come from a suspected catsup bottle in a restaurant.

Cranberries to Raincoats

Other instances of the use of spectroscopy ranging from examination of cranberries to raincoats, cable sheathing, gasoline and transformer oil were cited. One company suspected second hand oil was being sold for use in transformers. The spectroscope confirmed it.

In discussion of light wave standards, it was emphasized that the iron standard is not obsolete but will be supplemented by copper which gives wavelengths of value in the region below one one-hundred-thousandth of an inch long. Here iron does not give enough lines to be satisfactory for standards.

Of special significance at the meeting, was the large attendance of industrialists who, while not trained in spectroscopy, realize its possibilities for their industries and want to learn how they can utilize it.

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MEDICINE

New Type of Silicosis Found in Wales

A CONDITION corresponding to silicosis among metal miners has recently been found in coal miners of South Wales, Prof. S. Lyle Cummins of Cardiff, Wales, reported at the symposium on this important industrial disease held by the National Tuberculosis Association. Silicosis is a lung disease resulting from inhalation of particles of silica. These get into the air in the course of certain mining occupations and stone cutting. Persons who suffer from silicosis are very liable to develop tuberculosis. The (*Turn Page*)

METEOROLOGY

They Are Certainly Dog Days And This Explains the Name

THE PORTION of the summer through which the year is now passing, known as "Dog Days," beginning July 3 and ending August 11, has nothing to do with the extremely hot appearance of dogs these days or the reputedly greater prevalence of "mad dogs" during the period.

It derives its name from Sirius, the Dog star, most brilliant of the fixed stars. Since the early days of antiquity this particular period of the year has been associated with the greatest heat of the year.

In Greek mythology the heliacal rising of Sirius was associated with the coming of the dry, hot and sultry season. The evil effects of this period on vegetation led to a belief in the baleful influence of Sirius on human affairs in general. There is no truth in this superstition, of course, but the belief was adopted by the Romans and by them transmitted over the greater part of Europe, whence it came to America.

A muggy atmosphere, thunderstorms and vacations are associated with the Dog Days. Sirius rises with the sun about July 23 and the Dog Days include the period from 20 days before to 20 days after this simultaneous rising.

While this rising of the Dog star with the sun has no influence upon the weather it does provide an excellent sign for the time of year when disagreeable, hot weather is apt to prevail, particularly heat accompanied by dampness.

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South Wales coal miner's silicosis, however, apparently does not make its victims liable to fatal tuberculosis, as does the other type of silicosis.

The mixture of stone and coal dusts that the South Wales colliers inhale into their lungs may contain substances that add to the harmful effects of silica particles, Prof. Cummins suggested. Other substances in this mixture may tend to neutralize the effect of the silica. He emphasized the need for further study of this disease.

Silicosis is probably on the increase. It affects to an appreciable extent the tuberculosis death rate among industrial workers exposed. These conclusions were presented to the National Tuberculosis Association by Dr. A. J. Lanza of New York City.

No accurate estimate of the number of cases of silicosis in the general population can be made because there are no mortality statistics and the U. S. Census Bureau does not list it in its reports, Dr. Lanza said.

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PHYSICS

Two Kinds of Particles In Cosmic Rays

COSMIC RAYS entering the earth must consist in part of both negative and positive charged particles. For if the particles were only electrons or only positives, mathematical computations show there would exist electric potential differences of thousands of billions of volts between points that are relatively close together as astronomy counts distances, such as the distance light travels in a year.

This suggestion is made by Dr. W. F. G. Swann, director of the Franklin Institute's Bartol Research Foundation in a communication to the American Physical Society.

Some investigators have suggested that the cosmic rays consist of a mixture of electromagnetic radiation or photons and negatively charged particles or electrons. Recent experiments by Dr. Swann's associates have produced evidence that some of the particles may be speeding hearts of light atoms, positively charged.

Dr. Swann renews his theory that the cosmic rays may originate in the heavenly bodies and sees no theoretical reasons why both negative and positive particles should not be emitted with high energy from them.

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ASTRONOMY

Philadelphia to See Stars Shining From Sheet Metal Sky

ON A SHEET METAL dome, 65 feet in diameter and perforated with millions of small holes, one will soon be able to see reproduced the starry skies as they appear from any part of the earth at any time.

This will be possible when America's second optical planetarium opens about the middle of October as part of the Benjamin Franklin Memorial and The Franklin Institute, whose $4,000,000 building is nearing completion at a location close to the city's center. The planetarium, made by the Carl Zeiss optical works in Jena, Germany, is the donation of Samuel S. Fels, and will be known as the Fels Planetarium. The building will house also a technical museum similar in scope to the famous Deutsches Museum in Munich. The museum will open at a later date, probably in December.

Eighteen planetaria are now in operation in European cities. The Adler Planetarium, opened in Chicago three years ago, was the first in the United States. Planetaria have also been assured for Los Angeles and New York.

The projection device, the part of the apparatus imported from Germany, is a glorified stereopticon, and stands in the center of the hemispherical dome. Through 119 separate lenses, images of all the naked eye stars and planets, as well as the sun and moon, are projected on the dome's white inner surface, where they are seen by the audience, seated below around the instrument. The entire machine is controlled by the lecturer through a complicated switchboard. A number of motors cause the various objects to move in their proper orbits, but at greatly accelerated speeds. It is also possible to show the sky of the southern hemisphere, picturing stars which never can be seen from the United States.

The Fels Planetarium will be the first to have a truly hemispherical dome. Previous planetaria projection surfaces were made of stretched cloth, forming a series of flat figures. In Chicago's Adler Planetarium the cloth is stretched from a series of wooden rings, so that the dome consists of zones, one above another, and each forming the frustum of a cone. The Philadelphia dome is made of sheets of stainless steel, each one formed to the proper curvature.

As a solid metal dome would produce objectionable echoes, the steel sheets are perforated with millions of holes, one-sixteenth of an inch in diameter, and an eighth of an inch apart. Tests made by acoustic experts have shown that sound passes through such perforated metal as readily as through stretched cloth. The walls behind the dome are covered with sound absorbing pads, so that the voice of the lecturer will not be reflected, and the effect will be the same as if he were speaking on an open plain at night. In most of the other planetaria, echoes are avoided by a series of steel baffle plates hung behind the cloth dome. These reflect the sound but do not absorb it.

The astronomical section of the Franklin Institute Museum will include a public observatory, with two large telescopes, a reflector with a mirror 24 inches in diameter and a refractor with a lens 10 inches in diameter, as well as numerous models, astronomical photographs shown as transparencies, and historic instruments.

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ARCHAEOLOGY

New Type of Prehistoric Pottery Found in Mexico

POTTERY made by prehistoric Indian inhabitants of America, unlike any pottery known to archaeologists has been found by Dr. E. B. Sayles, archaeologist of Globe, Arizona, in the Mexican state of Chihuahua.

Dr. Sayles, who is collecting ancient pottery remains from Chihuahua with permission of the Mexican government, discovered some buff potsherds with red designs. These are unlike any of the well-known kinds of pottery made by prehistoric Indians in the Southwest. Nor have they a resemblance to anything known in central and southern Mexico, according to Eduardo Noguera, Mexican government archaeologist who has just visited Chihuahua to view Dr. Sayles' collection.

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ROBOT OF ROBOTS

This unusually fast and accurate mechanism, designed to control calculating machines in complex engineering problems, has many possible applications, including the automatic steering of aircraft and ships, automatic control of industrial processes, and the accurate guiding of astronomical telescopes. It was developed by Dr. H. L. Hazen who is shown watching it in operation.

PHYSICS

Machine Boss for Machines Invented By Engineers

Robot Designed to Control Calculating Machines Working Complex Problems May Also Direct Airplanes and Ships

A MACHINE that bosses another machine with unusual alertness, speed and accuracy, has been developed in the Massachusetts Institute of Technology's electrical engineering laboratory.

This new "servo-mechanism," as this robot is called, substitutes for human skill in operating calculating machines used in research. It consists of a combination of specially designed motors, photoelectric cells, vacuum tube amplifiers and other mechanical devices, and it follows an ink line drawn on paper like a dog with his nose to a trail.

Although built for research use, application of this M. I. T. servo-mechanism to automatic steering and stabilization of airplanes and ships, to gun control, to automatic control of industrial processes and other uses are foreseen. Robots are already doing the helmsman's work on large ships but they operate on a different principle.

So quick is the new servo-mechanism that it completes its control operation within one-twentieth of a second. Instead of nervously oscillating back and forth and achieving its purpose by periodically overrunning and underrunning its mark like some robots, the new servo-mechanism by delicate mechanism goes just far enough and does not need constantly to correct itself.

Electric Eye Follows Line

The invention of the new device was suggested by Dr. Vannevar Bush, M. I. T. vice-president, and it was developed by Dr. H. L. Hazen and other members of the staff.

In its present form the new servo-mechanism consists of a vacuum-tube amplifier, a small specially designed electric motor driven by the amplifier, and a mechanical torque amplifier. In its application to an engineering calculating machine, the servo-mechanism is required to make a pointer follow the line of a curve drawn on a sheet of paper. The device quickly and accurately follows the rambling path of ink which in the calculating machine represents part of a complex engineering problem.

On one side of the line to be followed, the paper is darkened with a black ink which reflects very little light. On the other side of the line, is clean white paper which reflects most of the light falling upon it. The pointer which is to follow the line consists of an open slit in an otherwise dead black sheet of metal through which the curve can be seen by a photoelectric cell or "electric eye." This slit, and the paper under it, is brightly illuminated by a small electric flashlight lamp.

The electric circuit is so adjusted that if the photo-cell receives too much light the motor will drive the slit toward the black part of the paper, while if it sees too much black, the slit is driven toward the white part. When the paper seen by the photo-cell is half black and half white the motor has no current through it and does not turn. Thus the center of the slit is always kept on the boundary between the black and white portions of the paper.

To prevent the slit from traveling too far, suitable "damping" or braking is provided, which stops the motor just as the slit has reached the correct position. It is very important to design a servo-mechanism with just the correct amount of this "damping."

In the motor lies the secret of the rapid action. The moving parts of this motor have very little weight, the iron which usually rotates having been made stationary. As a result, this motor can start and stop with great rapidity and takes but little current. For example, if the current from an ordinary radio receiver tube is suddenly connected to the motor it reaches nearly the normal speed of 500 revolutions per minute in about one-fiftieth of a second, having turned during this time about one-eighth of a revolution.

Among the numerous possible applications of the new servo device, one of the most interesting is the automatic steering of ships or aircraft by direct reading of the magnetic compass..

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The Front Cover

The photographer very likely took a more beautiful picture than he thought he would when, flying low over the Canadian Pacific's *Empress of Australia*, he snapped the photograph that adorns the front cover of this week's SCIENCE NEWS LETTER. The vessel has a gross tonnage of 21,850 tons and her displacement is 32,800 tons.

ASTRONOMY

Venus Enters Planetary Races

Moderate But Dependable Meteor Shower and Annular Eclipse Are Among Astronomical Events for August

THIS HAS BEEN a great year for planetary races. In May and early June, Mars and Jupiter staged such a contest in the evening sky, with the result that on June 4 diminutive Mars passed its huge plodding brother at a distance of about half the moon's diameter. This month the race is between Jupiter and Venus, and again the big planet is the loser.

For months Jupiter has been conspicuous in the evening, in the constellation of Leo, the lion. Its steady light, until recently brighter than any other in the vicinity, has made it easy to locate. But during the last month or two a rival has been creeping towards it. Rising higher and higher, night after night, in the western evening sky, is an even brighter planet.

This is Venus, which can now be seen for an hour or so after sunset. It is not shown on the maps accompanying this article because by 9:00 p. m. (standard time) in the middle of the month, which is the time represented by the maps, both Jupiter and Venus, and Mars as well, have already descended too low in the west. However, these planets are all so bright that they are quite easy to find about 7:30 or 8.00 p. m.

On the first of the month Venus is below and to the north of Jupiter, separated by about 15 degrees, which is the length of the handle of the Great Dipper. It is moving eastward at a speed of more than a degree a day. At the same time Jupiter is also moving in an easterly direction among the stars, but much more slowly; at least, his motion appears slower to us because he is so much farther away.

Venus passes Jupiter on August 17. At the moment when they are closest, Venus will be only a tenth of a degree to the south of its fainter companion. This will be about a fifth of the moon's diameter, and at that time it will take a rather keen eye to distinguish the two planets without some optical aid. Unfortunately, however, this spectacle will be of more immediate interest to the Chinese than to us, because at the time when they are closest, 6:00 a. m., eastern standard time, on Thursday the seventeenth, neither planet will be visible from any part of the United States.

But on the evening of the sixteenth they will be very close, separated by less than the moon's diameter, with Venus still to the north. When they appear the following evening, the latter planet will already have passed Jupiter, and will be only a little more than the moon's diameter to the other side. Then Venus will continue to draw away from Jupiter and pursue Mars. But that planet is itself moving rather rapidly, and not until October 14 will it be overtaken by the pursuer. Long before that time Jupiter will have disappeared completely from the evening sky for the season.

Brightest Planet

Venus is now brighter than any other planet can ever become, of the minus 3.4 magnitude, in the astronomer's scale. Jupiter, the second brightest of the planets, is of magnitude minus 1.2. Mars, which is now rather unfavorably situated because it is unusually far away, is only as bright as one of the fainter first magnitude stars. Its steady light and ruddy color, however, make it easy to identify.

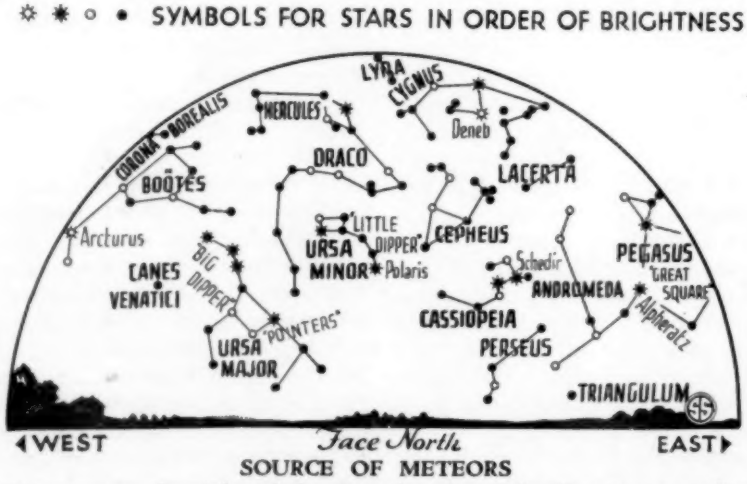
Still brighter than Mars, though not as brilliant as the other two, is the fourth planet which decorates the evening sky of August. This is Saturn, famous for the system of rings with which it is encircled. As shown on the map, this body is in the southeastern sky in the constellation of Capricornus. Its magnitude is plus 0.4.

Mercury, the last of the naked eye planets, is not visible at all in the evening this month but if you want to see it you can do so if you get up before sunrise on Thursday, the seventeenth. At that time, when people on the opposite side of the world, where the sun has just set, will be able to see the conjunction of Venus and Jupiter, you will be able to see Mercury, low in the east. On that day it will be at the position called greatest eastern elongation, when it rises in the east just before sunrise.

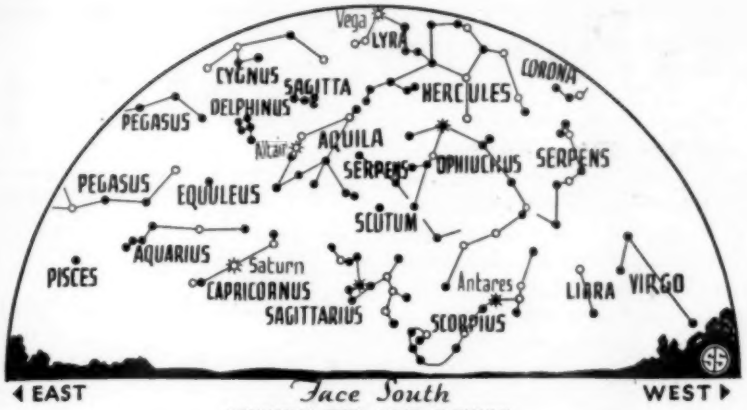
Five first magnitude stars can be seen these August evenings, and all are shown on the charts. Brightest is Vega, which marks the constellation of Lyra, and is now at the zenith. Only three stars in the sky exceed Vega in brilliance, and only one of the three, Sirius, the dog star, which appears in the winter heavens, can be seen from the latitude of most of the United States.

If Vega were at the distance of the sun, which fortunately it is not, it would send us fifty-one times as much light as that body. Its distance is so great that the light which reaches us from it tonight has been on the way since 1907, for the planet is 26 light years from us.

Lyra is also of interest because that is



August's meteors on the nights of the eleventh and twelfth will appear to radiate from the constellation of Perseus.



WHERE WE ARE GOING

The constellation Lyra, marked by the month's brightest star, Vega, indicates the direction the sun with all its planets is taking through the heavens.

where we are going. It is often stated that the earth moves in a circle around the sun. So it does, but the sun itself is moving along, carrying the earth and all the other planets with it, so that our real motion among the stars is a helix, like that of a corkscrew.

This motion is shown by observing how the stars seem to be moving towards or away from us. Of course, the motion of the stars is somewhat at random, but if a large number is considered, one would think, just as many would be approaching as would be receding. This is the case, but the approaching and receding stars are not uniformly distributed. In one direction, the majority of the stars are coming towards us, while in the opposite part of the sky most of the stars are receding.

The reason for this has long been known. It is that the motions are not made up solely of the stars' own movement, but are combinations of the stars' and the earth's motions. One group of stars seems to be approaching because we are approaching them. So also we are leaving behind those in the opposite part of the sky. Thus is found the speed of the solar system through space, which is so fast that in a year we travel four times 92,900,000 miles, the approximate distance from the sun to the earth.

Such studies also enable us to find the direction of this motion, which turns out to be towards the constellation of Lyra. If Vega were not itself moving, we should be there in 475,000 years. But at the end of that time, Vega will have moved on to other parts of the universe.

Second brightest star now visible is Arcturus, almost directly west. During the last few months the distance of this star has become pretty well known, for its light, which had been travelling for forty years, was used to start the illumination of Chicago's Century of Progress exposition in May. Arcturus is in the constellation of Bootes.

Third in brilliance is Altair, in Aquila, the eagle, which appears in the southeast. High in the east is Cygnus, the swan, with Deneb to mark it. Sometimes this constellation is called the northern cross, and Deneb is at the northern end of the cross. The remaining bright star of the five mentioned is Antares, in Scorpius, the scorpion, which is low in the southwest. The realistically curving tail of the beast makes this constellation rather conspicuous.

Moon to Hide Meteors

Last November we heard a great deal about meteors. Although the shower scheduled for that month did not give a performance equalling its great appearances of the past, it did put on the best show of many years. Perhaps this November will see them in even greater numbers. But during this month of August you can see one meteor shower which can usually be depended upon for an interesting display.

On the nights of August 11 and 12, especially after midnight, if you watch the eastern sky you will see these shooting stars. On almost any clear evening you can see them at the rate of about one an hour, but on the nights mentioned they may be as frequent as one or two a minute. Some may be as bright as a first magnitude star and may even leave trails which will last for a few seconds, but most will be fainter. Unfortunately, the moon is at last quarter on the twelfth, which means that it will rise at midnight, and its glare will blot out the fainter meteors.

These are called the "Perseid meteors," because they seem to radiate from the constellation of Perseus. Actually, this is an effect of perspective. The meteors are moving in parallel paths and, when they strike the earth's atmosphere and are burned to gas in a flash of light, the paths seem to converge in the distance just like the parallel tracks of a railroad.

The meteors move around the sun in an elliptical swarm which extends out to the regions of the planet Pluto, discovered a few years ago. The stream crosses the earth's orbit at the point we occupy in mid-August and so at that time many of them enter the atmosphere and are destroyed. But there are such vast quantities of meteors that these displays are likely to continue for ages.

As usual, astronomers who specialize in the study of meteors have asked the cooperation of the public in observing them. Dr. Charles P. Olivier, director of the Flower Observatory of the University of Pennsylvania, in Philadelphia, requests such reports. The simplest report is a half-hourly count of the total number of meteors seen during that period with the time of any particularly brilliant meteor and the length of time that its path remains visible, if it persists. A person with a little more astronomical skill might plot the meteors on a star map.

During August the moon is full on the fifth, at last quarter on the twelfth, new on the twenty-first and at first quarter on the twenty-eighth. Thus there will be moonlight evenings from the beginning of the month until about the seventh, and from about the twenty-fifth to the end. Incidentally, on the twenty-first the moon comes between the earth and the sun, producing a solar eclipse, but it will attract practically no scientific interest. This is because it is an annular eclipse, happening when the moon is so far from the earth that the sun is not completely covered. Even at mid-eclipse a ring of sunlight will remain visible.

The path over which this will be seen crosses Egypt, Palestine, Persia, Indo-China, Borneo and Australia. Over central and eastern Europe, northeastern Africa, all Asia but the northeastern part and over all Australia the sun will be seen partially eclipsed with the moon covering only a slice of its face. Because the sun will not be completely covered as seen from any part of the world, the many features of a total eclipse, for which astronomers often travel thousands of miles, will not be apparent.

NUTRITION

Strange Chinese Foods Rich in Minerals

THE WAYS OF CHINESE cookery may be strange but they are particularly good in providing calcium and phosphorus in the diet, it appears from experiments at Oregon State College. The results were explained to the American Home Economics Association.

The dish chosen for the tests was a typical Chinese one, it was reported by Pik Van Hoh and Jessamine C. Williams. The dish was pork spare ribs cut in small pieces and cooked in a solution of rice vinegar, soybean sauce, salt, and sugar for one hour at a low temperature.

An individual serving of this dish contains more calcium and almost half the phosphorus required in a day's diet, according to a minimum standard.

Most of the calcium and phosphorus were present in the finished dish, the experimenters concluded, as a result of the acid solution used in cooking, which drew these food elements out of the pork bone.

Science News Letter, July 29, 1933

PHYSICS

Uncertainty Principle Extension Under Test

FAINT LIGHT may be incapable of forming a distinct image of a very small area.

This extension of the uncertainty or indetermination theory of the new physics is being tested by Prof. John Q. Stewart and Dr. A. M. Skellett at Princeton University in a photographic study. Preliminary results reported in a letter to the *Physical Review* seem to show that scratches on a glass plate are fuzzier in focus when photographed in very faint blue light than when photographed in bright light.

One of the philosophically intriguing consequences of the new wave mechanics in physics is the uncertainty principle of Heisenberg, who in 1927, pointed out that it is possible to measure the exact position of a small particle, such as an electron, only at the expense of uncertainty as to its position. This principle of indetermination has been more disturbing to the older physical concepts than even the principle of relativity.

Three years ago, Prof. Stewart, reasoning by analogy, speculated that this matter of uncertainty might extend to faint light forming images. Since then he and associates have been carrying out tests.

The source of light is a pinhole in a dark room, the pinhole being illuminated from behind through a blue filter. At a distance of 2.5 meters (about 2½ yards) is mounted a glass slide having numerous fine scratches forming a scale of tenth-millimeters. A sturdy camera photographs these fine markings using only light from the pinhole. Faint light exposures varying from an hour or two up to twelve days have been made and compared with bright light exposures. The faint light exposures show a decidedly more blurred focus than the photographs made with brighter light. The experiments are being continued.

Science News Letter, July 29, 1933

PHYSICS

Cosmic Rays Studied On Himalayan Heights

STUDY of the elusive cosmic rays which bombard the earth without revealing so far their true nature, has taken an Indian physicist to high ridges of the Himalayas 19,500 feet above the sea.

The mountain climb is part of the world-wide cosmic ray survey organized by Prof. A. H. Compton of the University of Chicago. By gathering data on the intensity of the rays from space as they strike the earth at different altitudes and in different latitudes, physicists hope to learn the character of this radiation.

Reporting his journey, to the *Urusvati Journal* of the Himalayan Research Institute in New York, Prof. J. M. Benade expresses the belief that he has carried the cosmic ray search to a new height record for mountain work. Prof. Benade is professor of physics at Forman Christian College, Lahore. His part in the world survey is to take measurements of rays in Ceylon, Java, Singapore, Penang, Rangoon, Calcutta, Lahore, and at the highest attainable altitudes in the Himalaya.

The physicist and his party made their highest measurements at the mountain pass Lanyar La. Here they pitched an observation tent and spent two days taking readings. An effort to reach a 20,000 foot point of observation was unsuccessful.

Prof. Benade has forwarded his data to Prof. Compton.

Science News Letter, July 29, 1933

IN SCIE

SEISMOLOGY

Earthquake Barrage Recorded on Seismographs

A BARRAGE of earthquakes kept the world's seismographs shaking Wednesday, July 19. Records telegraphed to Science Service enabled the U. S. Coast and Geodetic Survey experts to locate the epicenter of the shock just south of the Aleutian chain, off the coast of Alaska, near the international date line and the island of Atcha. Three shocks were definitely located, all originating at about the same place at 5:45.5, 8:32.5, and 9:59.9 a. m. Eastern Standard time.

Complete study of the earthquake records will probably show that other shocks occurred in the same place during the day. The longitude and latitude of the epicenter are 51 degrees north and 174 degrees west. Since the center of disturbance was at sea, no reports of damage were expected.

Science News Letter, July 29, 193

PHYSIOLOGY

Green Lips Tell How Fast Blood Flows

GERMAN physiologists have worked out an ingenious method of estimating the velocity of blood circulation, which depends on the peculiar light reaction of the dyestuff fluorescein. The presence of this dye in the blood is indicated by a greenish color of the lips viewed under pure blue light in a darkened room.

In making a test, a small amount of fluorescein solution is injected into the blood stream, and the number of seconds it takes until the lips shine with the greenish light are noted. The method is being used in the study of various circulatory and cardiac disorders, and also in research on the physiological effects of sports. The minimum circulation time thus far observed has been seven seconds; an average circulation time is approximately twenty-one seconds.

Science News Letter, July 29, 193

IE FIELDS

ASTRONOMY

Tiny Planet Identified As Old Friend

THE TINY planet 1933HH, which was discovered April 22 at the Union Observatory, in Johannesburg, S. Afr., is identical with a minor planet that has been known for many years as 192 Nausikaa. Astronomers had been puzzled and wondered how an object so bright had escaped detection.

Observations by Dr. H. E. Wood, of the Union Observatory, on June 1, made it possible to compute accurately its orbit, which showed that it is not a new heavenly body.

The planet is now about ninth magnitude and it is becoming brighter. Moving northward through the constellations of Aries and Perseus, it can be seen in the eastern sky in the early morning. It may become bright enough to be seen with the naked eye before the end of the year, and it will be easily visible with small telescopes.

This planet is one of the numerous family of "asteroids," small bodies a hundred miles or less in diameter, most of which travel between Mars and Jupiter. Nearly 1,500 of them are known to astronomers, but the great majority are never visible except with large telescopes.

Science News Letter, July 29, 1933

BOTANY

Eel Grass Dying Of Mysterious Disease

EEL-GRASS, a valuable plant of the shallow waters along the coasts, is apparently threatened with extinction on the Atlantic seaboard. A study just completed by Clarence Cottam of the U. S. Biological Survey shows that it is practically wiped out over considerable areas and reduced to a mere remnant of its former abundance in many other places.

Eel grass is not eaten by eels, nor is it a grass. Its long, ribbony green leaves, as it trails in its masses under water, suggest both eels and tall grass, whence the name. It formed an important part of the food of certain species of geese, ducks and other wild fowl; so much so that after its dying out last year ducks were reported to be dying of starvation. Many lesser marine animals also depended on it for food, so that its passing will affect at least indirectly most of the animal life in the regions where it grew.

It had a direct economic importance for man, too, for it was harvested in considerable quantities for use as packing material, upholstery stuffing and a compost for fertilizer. Furthermore, its disappearance removes a flexible but effective breakwater that used to protect certain shorelines against destructive wave action, so that now erosion is going on more rapidly.

Science News Letter, July 29, 1933

ENGINEERING

New Italian Method Saves Steel in Buildings

BUILDINGS practically suspended around a central steel structure with no outside posts are now being constructed in Italy according to a plan worked out by the architect Guido Fiorini.

The scheme depends upon a special arrangement of tension members to balance the total weight of the structure about one or more central piers. The advantages claimed for this style of building are, a reduction in weight of the steel used to 70 per cent. of that of the conventional steel skeletons, and a saving of 50 per cent. in building costs due to a reduction in the number of foundations required. In addition, the "tension structure" system appeals to architects of the new school who are now able to design buildings with outside walls consisting almost entirely of glass if they so desire. Wide arcades at the street level are also possible.

Until comparatively recently, steel building construction has lagged in Italy because of the high cost of structural steel as compared with reinforced concrete in that country. A reduction in steel prices, however, together with the invention of the process of fusion welding, have given an impetus to steel construction. The new "tension structure" is a further effort in the direction of popularizing steel buildings. The French are also making use of Fiorini's invention in the development of a section of the city of Algiers.

Science News Letter, July 29, 1933

NUTRITION

Add Minerals to Milk to Make it Better Diet

A METHOD of adding copper and iron salts and manganese to milk has been developed at the University of Wisconsin by Prof. E. B. Hart and associates. This new treatment makes milk more nearly a perfect food on which man or other animals could live exclusively.

Despite its tremendous food value, it was found several years ago that milk could not be relied on as a sole source of nourishment. Animals fed solely on milk died of anemia. Prof. Hart and associates were among the first to discover that this was because milk was deficient in copper and iron salts, necessary for production of hemoglobin. Manganese has recently been found a necessary element of diet also.

The effect of the milk which has been mineralized by Prof. Hart's new process has been tested on experimental animals and on one of the students at the university. This young man lived for two months on a diet of this mineralized milk. He did not lose weight and he never complained of hunger.

Yorkshire pigs kept on an exclusive diet of this milk and cod liver oil for four and one-half months averaged about the same weight at the end of the period as pigs fed the usual full diet.

Science News Letter, July 29, 1933

ASTRONOMY

Spanish Astronomer Discovers New Comet

A COMET, presumably new, has been sighted by Prof. R. Carrasco Garrorena of the Madrid Astronomical Observatory, the international clearing house of astronomical telegrams at Copenhagen has been notified.

This Carrasco comet is a tenth magnitude object which should be visible through moderate sized telescopes in the southwestern evening sky just south of the constellation of Virgo and not far from the bright star Spica.

Observatories throughout the world have been notified by cable of the discovery and as soon as other observations of its position and motion are obtained, astronomers will compute its orbit. Then it will be known whether there is a chance that it will be seen with unaided eyes.

Science News Letter, July 29, 1933

INVENTION

The Barbed Wire Fence

"A Classic Invention"

For Nearly Sixty Years Barbed Wire Fences Have Stood Between Fields to the Dismay of Cattle and Intruders

IMPROVEMENT IN WIRE FENCES, by Joseph F. Glidden, U. S. Patent No. 157,124, *U. S. Patent Office, Washington, D. C., November* 24, 1874. *This is an exact reprint of the original patent.*

BE IT KNOWN that I, Joseph F. Glidden of De Kalb, in the county of De Kalb and State of Illinois, have invented a new and valuable Improvement in Wire Fences; and that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

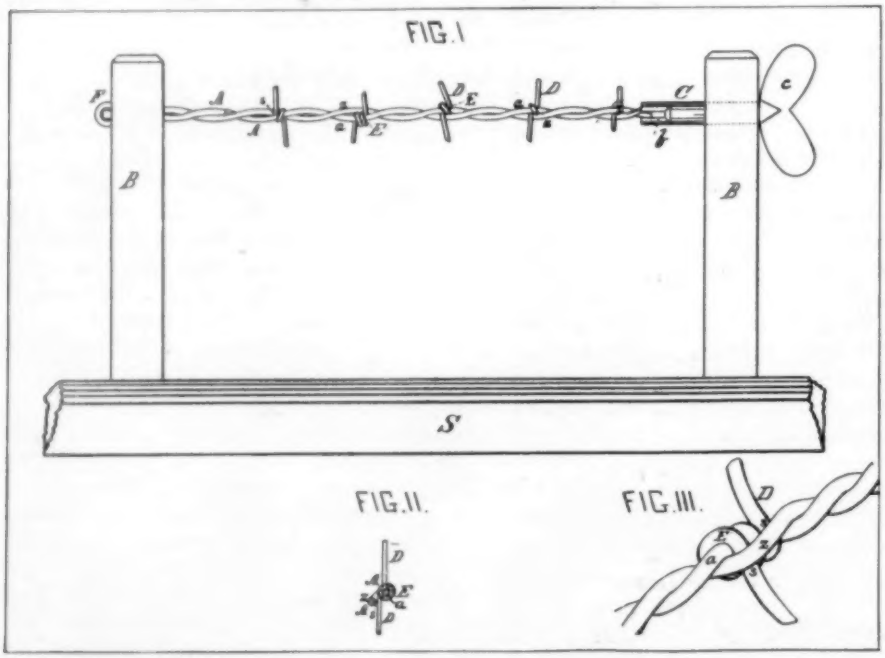
Figure 1 represents a side view of a section of fence exhibiting my invention. Fig. 2 is a sectional view, and Fig. 3 is a perspective view, of the same.

This invention has relation to means for preventing cattle from breaking through wire fences; and it consists in combining, with the twisted fence wires, a short transverse wire, coiled or bent at its central portion about one of the wire strands of the twist, with its free ends projecting in opposite directions, the other wire strand serving to bind the spur-wire firmly to its place, and in position, with its spur ends perpendicular to the direction of the fence-wire, lateral movement, as well as vibration, being prevented. It also consists in the construction and novel arrangement, in connection with such a twisted fence-wire, and its spur-wires, connected and arranged as above described, of a twisting-key or head-piece passing through the fence-post, carrying the ends of the fence-wires, and serving, when the spurs become loose, to tighten the twist of the wires, and thus render them rigid and firm in position.

In the accompanying drawings, the letter B designates the fence-posts, the twisted fence-wire connecting the same being indicated by the letter A. C represents the twisting-key, the shank of which passes through the fence-post, and is provided at its end with an eye, *b*, to which the fence-wire is attached. The outer end of said key is provided with a transverse thumb-piece, *c*, which serves for its manipulation, and at the same time, abutting against the post, forms a shoulder or stop, which prevents the contraction of the wire from drawing the key through its perforation in said post.

The fence-wire is composed at least of two strands, *a* and *z*, which are designed to be twisted together after the spur-wires have been arranged in place.

The letter D indicates the spur-wires. Each of these is formed of a short piece of wire, which is bent at its middle portion, as at E, around one only of the wire strands, this strand being designated by the letter *a*. In forming this middle bend or coil several turns are taken in the wire, so that it will extend along the strand-wire for a distance several times the breadth of its diameter, and thereby form a solid and substantial bearing-head for the spurs, which will effectually prevent them from vibrating laterally or being pushed down by cattle against the fence-wire. Although these spur-wires may be turned at once around the wire strand, it is preferred to form the central bend first, and to then slip them on the wire strand, arranging them at suitable distances apart. The spurs having thus been arranged on one of the wire strands are fixed in position and place by approaching the other wire strands *z* on the side of the bend from which the spurs extend, and then twisting the two strands *a z* together by means of the wire key above mentioned, or otherwise. This operation locks each spur-wire at its allotted place, and prevents it from moving therefrom in either direction. It clamps the bend of the spur-wire upon the wire *a*, thereby holding it against rotary vibration. Finally, the spur ends extending out between the strands on each side, and where the wires are more closely approximated in the twist, form shoulders or stops *s*, which effectually prevent such rotation in either direction. (*Turn Page*)



HOW THE BARBS ARE MADE

Glidden's patent drawing illustrating his improvement in fencing. Some of his contemporaries did not agree that it was an improvement, but the fencing has remained.

Should the spurs, from the untwisting of the strands, become loose and easily movable on their bearings, a few turns of the twisting-key will make them firm, besides straightening up the fence-wire.

What I claim as my invention, and desire to secure by Letters Patent, is—

A twisted fence-wire having the transverse spur-wire D bent at its middle portion about one of the wire strands *a* of said fence-wire, and clamped in position and placed by the other wire strand *z*, twisted upon its fellow, substantially as specified.

Science News Letter, July 29, 1933

PHYSICS

Photocell Tests Smoothness Of Polished Metal

DETERMINATIONS of the degree of smoothness of polished metals, important to scientists and engineers today, have recently been made by the French metallurgist, Dr. Albert Portevin, through the application of the photoelectric cell.

A beam of light is focused on the metal specimen so that it will be reflected to the sensitive cell. When the specimen is moved along in the path of the beam, any microscopic hills or valleys will register as fluctuations in the electric current produced by the cell due to variations in the reflected light.

Extensive use is made of smoothness determinations in the examination of machine parts subject to frictional wear. They are also valuable for indicating the relative efficiency of different abrasives employed in polishing metals.

Although numerous methods have been developed for studying the quality of polish, this latest adaptation of the ever popular photoelectric cell to the problem promises to supersede some of the laboratory methods now in vogue. This is particularly true in the case of the study of the surfaces of metals intended for corrosion tests. Here the initial degree of smoothness is of vital importance to the interpretation of the results of such tests.

Metals which have become colored during the process of corrosion, or upon heating as in the case of tempered steel, have to be examined with light consisting of only one wavelength (color) and a colored filter must be placed in the reflected ray to insure accuracy. If white light were used, the result would be unsatisfactory due to the presence of many different wavelengths.

Science News Letter, July 29, 1933

DENTISTRY

Exercise Good for Teeth Theory Seems Contradicted

THE EXPERIENCE of a South American Indian lad seems to contradict the modern theory that our teeth are bad because they do not get enough exercise from the soft foods we eat.

This lad, Moi-i by name, had never had any trouble with his teeth nor had he seen any signs of dental decay during the fifteen years he lived with his own people, the Makuxi Indians. His food during this period consisted of many fresh vegetables of different kinds, little meat, almost no salt and a good deal of hard cassava bread, which gave his teeth plenty of exercise, related Earl Hanson, who met Moi-i during the recent magnetic expedition of the Carnegie Institution of Washington. Mr. Hanson's observations are reported in the current issue of *Science*.

At the age of fifteen Moi-i was obliged to leave his people and go to work on the Brazilian National Ranch in the cattle plains. Here he ate the white men's food consisting of a great deal of meat, almost all dried and salted; milk and cheese; almost no vegetables, and a great deal of salt. After a year and a half he had to go the dentist for repair of the ravages of a bad case of dental caries, or tooth decay.

The interesting point, Mr. Hanson comments, is that while Moi-i's teeth had plenty of exercise chewing his native hard cassava bread, they must have had much more exercise chewing the quantities of dried meat he ate later.

"If exercise is the determining factor, his teeth should have improved instead of deteriorating," Mr. Hanson remarked.

Mr. Hanson calls attention to two other interesting facts. One is that Moi-i ate very little salt until he lived with white people, and that the Indians of Southern Venezuela believe the white men have bad teeth because they eat so much salt. The other point is that Moi-i, when he lived with the white people, gave up his native habit of constantly cleaning his teeth with charcoal.

Science News Letter, July 29, 1933

"Dry ice" is one of the newer aids in fire-fighting, particularly when fire breaks out in an underground electrical conduit where it is hard to extinguish.

MEDICINE

One Treatment Replaces Three For Diphtheria Protection

PROTECTION against diphtheria may now be given to infants and children with a single injection of toxoid, instead of three, Dr. J. N. Baker, Alabama State Health Officer, has just announced.

The new protective toxoid is the result of years of research by the late Dr. Leon C. Havens, for 12 years director of the state laboratories. The perfection of it was the last piece of scientific work done by Dr. Havens and is considered by fellow health officers a fitting monument to the man.

The new toxoid has been developed from the old toxoid, already widely used in diphtheria prevention work. Dr. Havens knew as did other scientists that when toxoid is treated with alum it forms a precipitate which is very slowly soluble. This precipitated toxoid is absorbed in the body much more slowly than old-style toxoid. Dr. Havens believed that this would make it more effective, since none of it would be wasted by elimination from the body before it had time to do its job of developing immunity or resistance to diphtheria. Investigations proved that this was correct and the use of the new toxoid has been approved by the U. S. National Institute of Health in Washington and the state public health committee.

"The finding by Dr. Havens of an immunizing agent for protection against diphtheria as potent as the present preparation will do much to revolutionize the campaign against diphtheria," Dr. Baker stated at a meeting in Montgomery, Alabama.

"Formerly it required three injections, a week apart, to secure adequate protection. With this new product one injection will immunize 95 to 98 per cent. of those susceptible."

Dr. Baker said further that with the reduction of the number (*Turn Page*)

of injections, a much wider use of this new protection will be possible. Medical experts have found that 75 per cent. of children of pre-school age are susceptible to diphtheria and it is in this group that most of the deaths occur.

"It is therefore of special importance that all children over six months of age be protected against diphtheria," the health officer continued in his address before the meeting.

With the new toxoid requiring only one injection instead of three, this job of protecting all the school children of a city against diphtheria can be done much more quickly.

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PSYCHIATRY

Insanity Gives Release From Hard Life

INSANITY is often a release from hard or unsatisfactory life, Dr. Mandel Sherman of the University of Chicago reported to the American Association for the Advancement of Science.

One exceedingly common form of insanity is religious mania. This is more frequent among women than among men, though the difference is greater among whites than among Negroes.

Another form of insanity is the delusion that you have serious bodily illness. This afflicts more white women than it does white men; but among Negroes the ratio is reversed, and more male Negroes than females suffer from wholly imaginary "mizries."

There appears to be a direct relationship between the occurrence of insanity and generally wretched, poverty-stricken living conditions, at least among the Negroes.

Science News Letter, July 29, 1933

RADIO

A POSSIBLE SOLUTION OF A MAYAN MYSTERY

an address by

C. Wythe Cooke

U. S. Geological Survey

To be given Friday, August 4, at 1:45 p. m. Eastern Standard Time over stations of the Columbia Broadcasting system. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

PSYCHOLOGY

Occupational Tests Reveal Undeveloped Talents

Clinic Makes Classification and Rehabilitation Service Available for Unemployed; Is Aid to National Recovery

SCIENTIFIC METHODS of occupational guidance, made available for the first time to those without money to pay for this expensive service, have revealed unsuspected talents among men holding inferior positions, records of the Occupational Testing Clinic at Minneapolis, Minn., show.

The man who fails at a routine or inferior job and is laid off is not necessarily too stupid for it; he may have superior abilities in a different line. Actual cases of a man talented as an architect but failing as a timekeeper, men with clerical ability who could not hold a job at ordinary labor, a potential engineer who could not make good in a round house labor gang, are typical of the records in the Occupational Testing Clinic files.

Thoroughly Discouraged

These men did not know of their abilities. For the most part they were thoroughly discouraged and considered themselves failures—down-and-outers. Some were dependent upon charity for the care of their families. In good times their wages may have ranged from 35 to 60 cents an hour. In bad times they were idle.

But the Occupational Testing Clinic's individual study of these cases showed the men to be victims, not merely of the depression, but of misplacement at jobs not suited to their individual aptitudes. Re-training, or in some cases, just a steer in the right direction, resulted in successful placement at a higher wage level and satisfaction for both employer and employee.

This scientific guidance has been made available to the unemployed in Minneapolis by the Employment Stabilization Research of the University of Minnesota. The following cases are typical of the way in which the laboring man may be benefited if the new United States Employment Service follows the example of public employment services in Minnesota and makes this service in occupational classification and rehabilitation available to the unemployed of the nation. The names used below are fictitious.

Case S 548. George Edwards is 26 years of age and has a wife and three children to support. The oldest child is six years old and the youngest two and a half. George's father was a barber. During the summer while George was attending high school he operated a labeling machine in a brewery, earning about $20.00 a week. He continued at this job after he had quit school, and was earning $22.50 per week when he married in 1925.

Since this job was seasonal in character, George obtained work as an extra man on a labor gang in a round house in the fall of 1926. He worked at this job for the railroad at $2.88 a day for about a year and eight months.

He has had no permanent work since 1928, although he drove a truck for a package delivery company for about six months, drove a taxicab for about three or four months, was chore boy in a bakery shop for about three or four months, fired a low pressure steam boiler for two winters, and during one summer when the street railway company was laying a new track, he acted as flag man.

The Occupational Testing Clinic discovered that this man had unusually high abilities along clerical lines and excellent mechanical abilities, combined with the typical interests of the engineer. It was very clear that this man should have been trained as an engineer, but that such training would be impossible unless some way could be found to maintain his family while the training was being given. Attempts were made to work out some program of caring for the family, but the charity organizations were already over-burdened with the families of unemployed men, and it was therefore impossible to offer the engineering training, although training was provided in various electrical skills useful in connection with radio repairs and maintenance.

This man succeeded very well in his

training, and will be able to maintain himself and his family by means of the skills developed. His aptitudes along these lines would not have been discovered had he not taken the occupational tests.

Case M 1992. Ralph Swartz is 35 years of age, unmarried, the son of a factory worker. He began work at the age of 15 in a rug cleaning factory, operating a soap machine at 25 cents an hour. After three years of this work he joined the army, and spent eight months overseas, where he received a gunshot wound which kept him in the hospital for about six months. Upon his return to this country, the Veterans Bureau started to re-educate him as a clerical worker. For two years he studied stenography and bookkeeping, under the direction of the Veterans Bureau. At the end of the two years, he obtained a job as a repair man on box cars in the railroad yard.

From Clerk to Architect

The company for which he was working sold out, and this man became a timekeeper for the purchasers, but held the job only a short time. For two years from 1927 to 1929, he was idle, and then obtained a job in the packing department of a plant manufacturing electric apparatus. In this job he has received forty cents an hour whenever the factory was operating.

The occupational tests indicated that Ralph Swartz possessed the interests and abilities typical of artists and architects. He had high mechanical aptitudes, great speed and accuracy in the use of his hands, and very good academic capacity, although he had obtained only a common school education. He liked to draw and had spent a considerable amount of time visiting the Art Institute. It was clear that this man should have been trained as an architect rather than as a clerical worker. The Veterans Bureau had assumed that because of his lack of high school education, it would be impossible for him to master architecture, while as a matter of fact the man actually had better abilities for taking architectural training than three-fourths of the high school graduates who do take it.

Since the man is now thirty-five years of age, it may be difficult for him to secure the training he should have had, but he has already made excellent progress in courses in mechanical drafting and free-hand drawing.

Science News Letter, July 29, 1933

EMPLOYMENT RESEARCH

Reorganization Threatens Occupational Testing Clinic

FOR TWO YEARS experts on personnel administration, economists, industrial social workers, vocational psychologists and medical specialists have been struggling to develop a scientific program for employment stabilization in Minnesota. Among other achievements they have succeeded in developing a highly efficient system of free public employment offices in Minneapolis, St. Paul, and Duluth. As work now draws to a close, the public employment offices are returned to the Minnesota State Industrial Commission.

The Minnesota program has received national and international recognition as a noteworthy attempt to develop a highly effective free employment system designed to analyze each applicant and to place him in the position for which he seems to be best fitted.

Those responsible for this new development of a high grade non-political employment service were given to understand that if increased funds for this service could be procured from the legislature that the service would be continued by the state on the same high plane. This was done and the legislature increased the appropriation for this service whereas appropriations for all other state services were decreased.

On July 1 the reorganized and improved employment office system was returned to the Industrial Commission, and unfortunately evidence of political manipulation appears again. The position of State Director of Testing and Guidance was abolished and the Scientific Director of this service dropped with five days notice. Two of the best qualified personnel workers have also been dropped. Furthermore, the increased appropriation secured by the sponsors of the improved service has been arbitrarily taken away.

This has occurred in the face of an enormously increased burden to be placed upon the employment service by the Federal public works program which provides that workers be recruited through public employment offices.

Scientific experts in the field of employment stand ready to aid the government in the recovery program but it is obvious that they cannot render effective service if the machinery they are to create is kept in politics. One method by which the Federal government can protect itself is to call upon such non-partisian scientific organizations as the National Research Council, the Social Science Research Council, the National Occupational Conference, and the Personnel Research Federation for cooperation. These organizations could well assume the responsibility for passing upon the qualifications of persons to be appointed to important positions.

If prompt action of this sort is not taken, there is every likelihood that a large part of the Federal recovery program will break down because favoritism and inefficiency will creep into the local administrations.

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STANDARDS

Setting Commercial Standards Relinquished by Government

THE WITHDRAWAL of Government participation in the setting of commercial standards is indicated in the announcement just made by the Secretary of Commerce that part of the activities of the Commercial Standards Group of the National Bureau of Standards would be relinquished to a private organization, the American Standards Association. Commercial standards will not be issued by the Bureau, but by the American Standards Association, it is planned.

In a letter to Howard Coonley, president of the American Standards Association, Secretary Roper offered full cooperation of the Bureau of Standards "in carrying through the transfer with a minimum of disruption of the work, and also in providing through the Bureau's facilities at least a part of the research work necessary in connection with standardization projects." In explaining the correspondence to the press, however, he added that this did not mean that any of the personnel dismissed from the Bureau would be restored for this work.

In response to an inquiry by Science Service the American Standards Association stated that part of the personnel of the Commercial Standards Group of the Bureau may be taken over by the Association during the next few months. They do not, however, plan to continue the testing work which has been done at the Bureau of Standards in connection with the making of specifications and the laying down of standards.

"The American Standards Association will not itself carry on tests," it was asserted officially on behalf of the Association. "This may, however, be done by other groups. Present procedure provides for representation of the public in making specifications and this policy will be continued.

"The difficulty has been and probably will continue to be that of finding interested and technically competent consumer groups willing to work actively on specifications. This is the only bar to greater consumer representation."

The American Standards Association is an organization administered by a board of directors composed of industrial executives. It is supported by 37 member-bodies, including representative engineering associations and industrial organizations, and some 200 companies.

Bureau of Standards officials point out that not all the activities formerly carried on by the Bureau will be undertaken by the Association. The making of specifications for use by the Government departments could hardly be handled by this organization, for example.

Science News Letter, July 29, 1933

ENGINEERING

Only Two Mine Rescue Cars Ready for Dangers

ALL BUT TWO of the eleven mine rescue cars of the U. S. Bureau of Mines must be put out of commission, because no funds are available to operate them. The funds for mine rescue work have been cut from $317,000 appropriated by Congress to $212,000.

During the coming year, the Bureau will have about a hundred calls for aid in connection with mine accidents and disasters. Many of these will have to go unresponded to because the Bureau simply does not have the money to lend its customary aid to this type of human distress.

Greater Need, Less Help

Last year the Bureau gave assistance in connection with about 20 mine explosions, about 25 fires, and around 50 miscellaneous accidents. This year, it is anticipated that the need for help may be greater, because last year was exceptionally low in disasters and because this year brings additional hazards with the starting up of mines long idle. The danger of explosion is especially great where gases have been accumulating during a period when the mine was not working.

The decommissioned cars are being kept at strategic points throughout the mining sections of the country, so that as soon as funds are again provided for their operation they will be where they are most needed. Three of the idle cars are in Pittsburgh, two at Norton, Va., and one at each of the following points: Denver, Salt Lake City, Madisonville, Ky., and Junea, Alaska. Of the two that are being kept in operation, one is now on exhibit at the Century of Progress Exposition in Chicago. The other is in West Virginia.

The trained men who were the crews of the decommissioned cars have also been laid off. The Bureau has no funds to pay them with. This means a great loss to the service, because of the fact that even the best of mining engineers requires at least two years of training in the service before he can be efficient in safety work. No amount of experience in ordinary mining will prepare a person to meet a disaster of a type with which he has not had experience.

The mine rescue cars, when not actually giving aid at the scene of disasters, have been kept busy giving training in first aid and mine rescue work and in accident prevention. In the fiscal year ending June, 1932, practically 100,000 persons were given this sort of training. In 1933, lack of funds caused the number to drop below 75,000. It is estimated that in the coming fiscal year not more than 40,000 can possibly be given the advantage of this training.

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GEOLOGY

Geological Survey Dismissals Held Up

THE DISMISSAL of professional and sub-professional employees in the Geological Survey was delayed by Secretary of the Interior Ickes pending an investigation of their efficiency ratings. Complaints made to the Secretary by some of the dismissed staff led to the action.

The Secretary also relaxed his former policy requiring outright dismissals rather than long administrative furloughs. He has now provided that the geologists and topographers may be put on split furlough to allow them time to place themselves in other positions.

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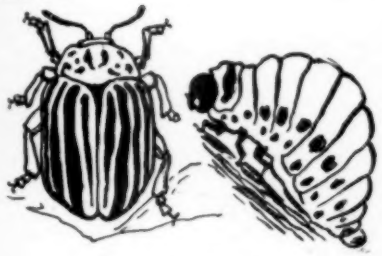
It is reported that the Japanese are endeavoring to increase their dairy supplies, hoping that more milk-drinking will make bigger-boned Japanese.

In one of the newest hospital rooms where operations on the eye are performed, observers can look down through glass, from a gallery, and see the operation without the old disadvantages of being close to the table.

NATURE RAMBLINGS
by Frank Thone

ENTOMOLOGY



Potato Beetle

HIGH SUMMER, and a hot sun overhead Young Johnny, rebellious back stooped over potato hills, picks off striped beetles and grumbles at an unjust world. It would be a much better universe if the potato-bugs would eat up all the darn potatoes, and let a fellow go swimming!

Young Johnny's great-grandfather, back before the Civil War, had other tasks to try his youthful soul, but picking potato-beetles was not among them. These littled striped pests, now the most formidable of all insect enemies of the potato, did not cross the Mississippi until about 1864.

The insect is commonly called the Colorado potato beetle, but that is probably a base slander on a state that has suffered even more from their invasion than have most of her eastern sister commonwealths. Most probably its native home is on the Mexican highlands.

Originally it was a feeder on a wild relative of the potato, the buffalo burr. Then the cultivated potato invaded its bailiwick, and it found the leaves of this new plant much more tasty. So it multiplied and increased, and possessed the potato fields. It seems to have a very decided preference for some special flavor in the foliage of this one family, for besides potatoes it also attacks tomatoes, eggplants, peppers and tobacco, all of which are botanical cousins.

Because of its general nastiness, the potato beetle is not much troubled by birds. Even the almost omnivorous hen won't eat it. But that pleasantest of our game girds, the bobwhite quail, will. Which is another reason for befriending bobwhite.

Science News Letter, July 29, 1933

•First Glances at New Books

Additional Reviews On Page 80

Physiology

HOW YOU ARE MADE—Amabel Williams-Ellis—*Macmillan,* 96 p., $1. This small book is designed to give adolescents a "palatable" but clear account of the human body and its functions. The simple, matter-of-fact style has a charm that should make the book successful.

Science News Letter, July 29, 1933

Sociology

THE DISABLED MAN AND HIS VOCATIONAL ADJUSTMENT—Roy N. Anderson—*Institute for the Crippled and Disabled,* 102 p., $1. A study of the types of jobs held by 4,404 orthopedic cases in relation to the specific disability. Between the lines of this reference book, you may read many a story of courage and adjustment to stupendous handicaps, as in the case of the two men listed who, although having both legs amputated, were holding jobs as salesmen of artificial limbs.

Science News Letter, July 29, 1933

Psychology

A BIBLIOGRAPHY OF MENTAL TESTS AND RATING SCALES—Gertrude H. Hildreth — *Psychological Corporation,* 242 p., $3. This list of tests and scales is one which has been maintained in card index form at Teachers College, Columbia University. Information is included regarding the date of publication and revision and the publisher from whom they may be obtained. No attempt is made to evaluate them, however.

Science News Letter, July 29, 1933

Health Education

BROADCASTING HEALTH—J. Mace Andress and I. H. Goldberger—*Ginn,* 401 p., 80c. There is a freshness and novelty of style and presentation in this book which lift it far out of the class of usual health texts for grade pupils. The authors confine themselves to health aspects of food and nutrition, which their long experience in health education shows them are sufficiently important and broad subjects to deserve an entire year's study.

Science News Letter, July 29, 1933

Ethnology

HOLLOW FOLK—Mandel Sherman and Thomas R. Henry—*Crowell,* 215 p., $2. Less than a hundred miles from the capital city of the United States live Blue Ridge mountain folk who seem to belong to another world entirely. Until 1928 the ragged children had never seen a flag, or heard of the Lord's Prayer. A group of psychologists, sociologists, a psychiatrist and a nutritionist studied five of these hollow communities, that are like a graduated scale of mountain society. What they found out about the mentality, personalities, habits and ways of these isolated Americans is told vividly in this book. The collaborator, Mr. Henry, is science editor of the *Washington Star.*

Science News Letter, July 29, 1933

Botany

BOTANY: PLANTS AND GARDENING—*Encyclopaedia Britannica,* 239 p., 37 pl., $3. This appears as No. 9 of the Britannica Booklets, and presents articles reprinted from the Fourteenth Edition of the Encyclopaedia, well arranged, illustrated and indexed. It is an excellent reference book.

Science News Letter, July 29, 1933

General Science

MASSACHUSETTS STATE NAME, FLAG, SEAL, SONG, BIRD, FLOWER AND OTHER SYMBOLS—George Earlie Shankle—*H. W. Wilson Co.,* 16 p., 25c. Similar booklets are available for the states of Minnesota, Virginia and Washington. A list of outstanding state histories completes each pamphlet.

Science News Letter, July 29, 1933

Geology

REPORT OF THE STATE GEOLOGIST ON THE MINERAL INDUSTRIES AND GEOLOGY OF VERMONT, 1931-1932—*Free Press Printing Co.,* 387 p., free. Distributed through the Division of Documents, Vermont State Library, Montpelier, Vermont.

Science News Letter, July 29, 1933

Chemistry

QUANTITATIVE CHEMICAL ANALYSIS—George McPhail Smith—*Macmillan,* 199 p., $2.25. Third edition.

Science News Letter, July 29, 1933

Mental Hygiene

FORTY-FOURTH ANNUAL REPORT OF THE NEW YORK STATE DEPARTMENT OF MENTAL HYGIENE—Frederick W. Parsons—*J. B. Lyon Co.,* 357 p.

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•First Glances at New Books

Additional Reviews On Page 79

Medicine

FRONTIERS OF MEDICINE—Morris Fishbein—*Williams and Wilkins,* 207 p., $1. One of the Century of Progress Series. Medical progress—not of one century but of more than twenty centuries—moves swiftly across the pages of this small volume. The reader will be stirred by the drama of the story as Dr. Fishbein tells it at the same time that he is being enlightened as to the significance of the great progress that has been made since medicine became a science as well as an art.

Science News Letter, July 29, 1933

Sociology

WOMEN IN THE TWENTIETH CENTURY—Sophonisba P. Breckinridge—*McGraw-Hill,* 364 p., $4. One of the monographs published under the direction of the President's Research Committee on Social Trends. The volume is organized in three parts discussing respectively: Women's Use of Spare Time, Women and Gainful Employment, and Women and Government.

Science News Letter, July 29, 1933

Hygiene

HEALTH AND ENVIRONMENT—Edgar Sydenstricker—*McGraw-Hill,* 217 p., $2.50. Readers with a liking for facts and figures will revel in this book with its mass of carefully compiled, accurate information on how environment affects health and length of life. Environment here includes social and economic status and occupation as well as geographic situation. Special students of the subject will find the book particularly valuable. It is one of the monographs in the series, Recent Social Trends in the United States.

Science News Letter, July 29, 1933

Ichthyology

THE FISHES OF THE . . . PHILIPPINE SEAS AND ADJACENT WATERS—Henry W. Fowler—*Govt. Print. Off.,* 465 p., 50c. The fifth part of a series of studies of the fishes of the Albatross collection, appearing as National Museum Bulletin 100, Vol. 12.

Science News Letter, July 29, 1933

Physics

THE METHOD OF DIMENSIONS—Alfred W. Porter—*E. P. Dutton & Co.,* 80 p., 85c. Since the time of Galileo scientists have been attempting to determine what kind of dimensions are really fundamental. With brevity, but with considerable detail, the emeritus professor of physics in the University of London shows some of the applications of the method of dimensions and he discusses how recent discoveries have forced the modification of what at one time was thought to be fundamental.

Science News Letter, July 29, 1933

Library Science

WORLD DEPRESSION—WORLD RECOVERY—Henry D. Gideonse—*American Library Association,* 22 p., 25c.

COLLAPSE OR CYCLE — Paul H. Douglas—*American Library Association,* 23 p., 25c.

LIVING WITH MACHINES—W. F. Ogburn—*American Library Association,* 16 p., 25c.

MEETING THE FARM CRISIS—J. H. Kolb—*American Library Association,* 24 p., 25c.

LESS GOVERNMENT OR MORE?—Louis Brownlow and Charles S. Ascher—*American Library Association,* 22 p., 25c.

A new series of booklets entitled EXPLORING THE TIMES issued by the American Library Association to enable librarians to advise readers on current problems and events.

Science News Letter, July 29, 1933

Biography

THOMAS ALVA EDISON, THE YOUTH AND HIS TIMES—W. E. Wise—*Rand McNally,* 252 p., $2. A biography of Edison's youth written in easy narrative style for boys. It is a junior literary guild selection.

Science News Letter, July 29, 1933

Psychology

ADOLESCENT GIRLHOOD — Mary Chadwick—*John Day,* 303 p., $3.50. A book by a British author, containing advice for the parents of a normal growing girl.

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Psychology

A POINT SCALE OF PERFORMANCE TESTS. VOLUME II, THE PROCESS OF STANDARDIZATION — Grace Arthur — *Commonwealth Fund,* 106 p., $1.50.

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Archaeology-Philology

THE ORIENTAL INSTITUTE—James Henry Breasted—*Univ. of Chicago Press,* 455 p., 209 illus., $4. Attractively illustrated and written by an archaeologist who knows how to tell about his work simply and vividly, this account of a great institute's activities is well worth reading. The Institute, of which Dr. Breasted is director, has been at work 13 years finding out: "How did man become what he is?" The quest has led expeditions to Egyptian tombs and deserts, Assyrian palaces, city mounds in Palestine and other places where man's past is hidden in the earth. The book is Volume 12 in the University of Chicago Survey Series, in which projects at the University are being described.

Science News Letter, July 29, 1933

Chemistry

A TEXT BOOK OF CHEMISTRY—H. A. Wootton and C. W. R. Hooker—*Macmillan,* 488 p., $1.75 This volume by two British science teachers is intended for use as a text in elementary chemistry courses. Interesting is this observation by the authors: "We wish to insist that Chemistry is a cultural subject—as much so as Greek or Philosophy—and we have tried to treat it in that spirit. In presenting it we have not felt constrained of necessity to the mere statement of a fact in the dreariest and most matter-of-fact way. The days are gone when dullness was a quality to be counted upon in a school text-book."

Science News Letter, July 29, 1933

Travel-Geography

TERRY'S GUIDE TO THE JAPANESE EMPIRE—T. Philip Terry—*Houghton Mifflin,* 799 p., $5. A revised and augmented edition of a guide which also covers Korea and Formosa, with chapters on Manchuria, the Trans-Siberian Railway and the chief ocean routes to Japan.

Science News Letter, July 29, 1933

Mathematics

ELEMENTS OF COORDINATE GEOMETRY—J. M. Child—*Macmillan,* 468 p., $3.25.

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